



# ICAO

*International Civil Aviation Organization*

**Tenth Meeting of the Aeronautical Communication Services Implementation Coordination Group (ACSICG/10)**

*Bangkok, Thailand, 24 - 26 May 2023*

**Agenda Item 3:** Review the report of the Eleventh meeting of Common aeRonautical VPN Operations Group (CRV OG/11) and CRV OG Ad-Hoc Governance Group

## **OUTCOMES OF THE ELEVENTH MEETING OF COMMON AERONAUTICAL VIRTUAL PRIVATE NETWORK OPERATIONS GROUP (CRV OG/11)**

(Presented by the Secretariat)

### **SUMMARY**

This paper presents the discussions and relevant outcomes on Eleventh Meeting of the Common aeRonautical Virtual Private Network Operations Group of APANPIRG (CRV OG/11).

## **1. INTRODUCTION**

1.1 The Eleventh Meeting of the Common aeRonautical Virtual Private Network Operations Group of APANPIRG (CRV OG/11) was held from *1 to 3 February, 2023* in ICAO Asia and Pacific Regional Office, Bangkok, Thailand. The Meeting was attended by 65 participants from 19 Member States/Administration. The meeting report, working papers, information papers, and other resources can be accessed by the following link:

<https://www.icao.int/APAC/Meetings/Pages/2023-CRV-OG11-.aspx>

1.2 This paper summarized relevant information and updates with the highlight on the outcomes of CRV OG/11 to be reviewed by the twenty seventh meeting of Communications, Navigation, and Surveillance Sub Group (CNS SG/27) of APANPIRG, and the thirty fourth meeting of Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/34).

## **2. DISCUSSION**

2.1 The summary of discussion in the Meeting is given in following paragraphs.

*Outcomes of CRV Governance Workshop – Sec (WP/16)*

2.2 The CRV OG/11 Meeting reviewed the outcomes of the ICAO Asia Pacific Idea Generation Workshop: *CRV Governance* held at the ICAO APAC Office, Bangkok, Thailand, on **31 January 2023**. The Workshop was attended by **41** participants from **13** States/Administrations.

2.3 A total of **Three (3)** presentations were delivered discussing REDDIG II (SAM Regional IP Network) governance structure by Regional Officer CNS, ICAO SAM Office, New PENS governance structure by PENS Management Unit Lead of EUROCONTROL, and CRV governance

structure by CRV OG Co-Chair (Asia). The further sessions brainstormed the improvement of CRV governance to meet current requirements and future challenges. The Workshop report, presentations, and other resources can be accessed by following link: <https://www.icao.int/APAC/Meetings/Pages/2023-CRV-Governance-Workshop.aspx>

2.4 The Workshop agreed to create the **CRV OG Ad-hoc Governance Group** for preparing and presenting the **potential CRV OG Governance model** to future CRV OG Meetings. Australia, Japan, Jordan, Fiji, India, Hong Kong China, New Zealand, Singapore, Thailand, and USA volunteered to join the group, led by CRV OG Co-Chairs. It was agreed that the Terms of Reference (ToR) of CRV OG Ad-hoc Governance Group would be finalized by the existing CRV OG Ad-hoc Expert Group planned to meet virtually on 20 April 2023.

2.5 Additionally, CRV OG/11 meeting concurred that the First Meeting of **CRV OG Ad-hoc Governance Group** should be organised as **In Person Meeting** to have an opportunity for detailed deliberation about the ToR of the group and future roadmap. The Meeting will be organised from **22-23 May 2023** with ACSICG/10 Meeting planned to be held from **24-26 May 2023** for Member States convenience.

2.6 Fiji shared its offer to host the joint meeting of CRV OG Ad-hoc Governance Group and ACSICG/10 from 22-26 May 2023. The CRV OG/11 meeting appreciated the generous offer and shared gratitude to Fiji. The Member States interested in joining the group in future were invited to share their interest with ICAO Secretariat by email. However, due to limited time to arrange for the meeting to host by Fiji, it was decided by ICAO APAC Office to organize the successive meeting of CRV OG Ad-hoc Governance Group and ACSICG/10 from 22-26 May 2023 in Bangkok, Thailand.

2.7 The CRV OG Ad-hoc Expert Group meeting on 20 April 2023 finalized the ToR of CRV OG Ad-hoc Governance Group, which was further discussed in CRV OG Ad-hoc Governance Group Meeting from 22-23 May 2023. The Outcomes of CRV OG Ad-hoc Governance Group first Meeting are being shared by **WP/04** to this Meeting.

*CRV OG Operations Manual Status - New Zealand (WP/03)*

2.8 New Zealand presented the status of the current draft of the CRV OG Operations Manual. The CRV OG/11 meeting was informed that since the publication of the CRV OG Operations Manual in April 2022, there have been many updates, including those coming from the CRV OG Ad Hoc Groups. The updates in different sections were explained in detail. The CRV OG/11 meeting adopted the **Decision CRV OG/11/01 - Publish the updated APAC CRV Operations Manual (CRV OG OM v1.2)**.

2.9 The latest version of the CRV OG Operational Manual has been published on [ICAO APAC e-docs](#) under CNS, [ICAO APAC CRV Secure portal](#), and on the [CRV portal](#) hosted by Airways New Zealand, and the relevant information has been shared with Member States/Administration through State Letter **Ref.: 8/2.15 – AP034/23 (CNS)** dated **22 February 2023** on the subject - *Publication of ICAO APAC CRV OG Operations Manual v1.2 and ICAO APAC CRV Implementation Plan v2.2*.

2.10 Nepal suggested incorporating relevant guidance in the form of Process and Procedures into the CRV OG OM clarifying that Member States can request support of ICAO Secretariat and CRV OG for dispute resolution matters or other significant issues if arises. The CRV OG Ad-hoc Expert Group will discuss the possibility of adding such provisions and draft relevant clauses to add in CRV OG OM.

*Outcomes of CRV OG Experts Ad-hoc Group Meetings – New Zealand (WP/09)*

2.11 The paper presented the outcomes of the APAC CRV Ad-Hoc Expert Group

discussions held last year after the CRV OG9. The CRV OG/11 meeting noted that seven virtual Ad-hoc Meetings were held between CRV OG/9 organised from 25-27 January, 2022 till date, and one distinct Meeting was held with the SWIM Task Force task leads on 28 October, 2022. The outcomes of the Ad-Hoc Group Expert Group discussions on contract extension, upgrade/downgrade CRV circuits subscribed, different CRV Users and their joining process, and Package D+ formalization were presented, which were further reviewed in CRV OG/11 by separate working papers. Other topics, including the mandate of firewall, common Package review, chair’s functions, and operations manual as a formal document, were discussed.

*Update to CRV Implementation Plan – Singapore (WP/19)*

2.12 The paper presented the proposed updates/editorial changes to the CRV Implementation Plan for review and adoption. The CRV OG/11 meeting agreed to publish the CRV OG Implementation Plan and adopted the **Decision CRV OG/11/02 - Update to the CRV Implementation Plan**. The latest version of CRV OG Implementation Plan without restricted information has been published on [ICAO APAC e-docs](#) under CNS Section. The latest version of CRV OG Implementation Plan has been uploaded on the [ICAO CRV Secure portal](#), and [CRV portal](#) hosted by Airways New Zealand. The relevant information has been shared with Member States/Administration through State Letter **Ref.:** 8/2.15 – AP034/23 (CNS) dated **22 February 2023** on the subject - *Publication of ICAO APAC CRV OG Operations Manual v1.2 and ICAO APAC CRV Implementation Plan v2.2*.

*ATN Documentation Tree Update – USA (WP/20)*

2.13 The paper presented an update of the **Asia/Pacific regional ATN Documentation Tree**. The CRV OG/11 meeting deliberated the proposed APAC ATN Documentation Tree and various CRV documents suggested to be placed in the Tree. Supplementary consultation requirements with more Member States for further modifications and updates were sensed. The proposed ATN Documentation Tree, provided in **Appendix A** of this paper, was referred to as *the first snapshot of the Tree*, which required more deliberation. The ACSICG/10 Meeting was invited to review and update the Tree, and formulate the draft Decision to publish ATN Documentation Tree for CNS SG/27 consideration if required.

2.14 The CRV OG/11 Meeting agreed that the CRV OG Ad Hoc Expert Group will work on modifying relevant CRV documents and updating the CRV OG Operations Manual to ensure that any changes within CRV consider modifications required to the document tree.

2.15 The CRV OG/11 Meeting arranged that as the current APAC ATN Documentation Tree uploaded on ICAO APAC Website was not updated for a long time, the ICAO Secretariat will take necessary action to update ATN Documentation Tree on the [ICAO APAC Regional Implementation Projects webpage](#) with the modified first snapshot of the Tree after ACSICG/10 modifications. The ATN Documentation Tree would be amended in future as more modifications would be made by ACSICG/CRV OG Meetings.

2.16 With aforementioned, the ACSICG/10 Meeting is requested to review and update the Tree and endorsed following draft conclusion for CNS SG/27 consideration:

<b>Draft Conclusion ACSICG/10/xx – Adoption of the Asia/Pacific Regional ATN Documentation Tree</b>	
<p>What:</p> <p><b>a.</b> the ATN Technical Document be published in a loose-leaf form to include future amendments to the Document; and</p> <p><b>b.</b> the ATN Documentation Tree provided in <b>Appendix A</b> be adopted.</p>	<p>Expected impact:</p> <p><input type="checkbox"/> Political / Global</p> <p><input type="checkbox"/> Inter-regional</p> <p><input type="checkbox"/> Economic</p> <p><input type="checkbox"/> Environmental</p> <p><input type="checkbox"/> Ops/Technical</p>

<p>Why: The current ATN/AMHS Documentation Tree published on ICAO APAC Website is not updated for few years. Therefore, it required updates. Additionally, some documents related to CRV are required to add and other required to delete into the tree due to obsolete documentation</p>	<p>Follow-up: <input type="checkbox"/>Required from States</p>
<p>When: 26-May-23</p>	<p>Status: Draft to be adopted by Subgroup</p>
<p>Who: <input checked="" type="checkbox"/>Sub groups <input type="checkbox"/>APAC States <input type="checkbox"/>ICAO APAC RO <input type="checkbox"/>ICAO HQ <input checked="" type="checkbox"/>Other: CRV OG</p>	

2.17 Pakistan questioned if, as of today, joining CRV is mandated by ICAO or if it is considered a recommended practice. ICAO Secretariat informed that the 54th Conference of Directors General of Civil Aviation, APAC Region, held in 2017 created an **Action Item 54/20**, which sets and monitors **2020 as the target for CRV implementation for all ANSPs**, to optimize each individual cost benefit analysis, and note that failing this, pessimistic assumptions might threaten the roll-out of CRV initiative. In addition, CRV Implementation is **one of the Beijing Declaration commitments** done at Ministerial Conference in Beijing in 2018. By the declaration, Member States committed to join CRV **by the end of 2020**. Additionally, for past few years, various APANPIRG Meetings have encouraged Member States to join CRV as soon as practicable. Moreover, as per APANPIRG Conclusion APANPIRG/33/7, States should join CRV **by 31 December 2023**. Therefore, implementation of CRV can be considered a mandatory requirement by APANPIRG. In future, the non-implementation of CRV may also be considered an air navigation deficiency.

*Risk Assessment framework for CRV OG – New Zealand (WP/22)*

2.18 The paper presented a risk assessment framework for CRV. Over years of CRV operations, various installations and CRV processes issues have been encountered. These issues can be considered as the risk impacting availability of CRV network and services. The CRV OG/11 meeting noted that these risks were documented in the Airways New Zealand risk evaluation template, which can be accessed on the portal [APAC CRV - Risk Register.docx](#), which has criteria crafted to suit and reflect Airways New Zealand. The CRV OG/11 meeting noted it would be prudent to create a Risk Evaluation Framework for the CRV against the ICAO DOC 9859 Safety Management that would suit the particular environment for CRV. The reviewed criteria for the consequences by categories to reflect the CRV and risk assessment framework is provided in **Appendix B** of this paper.

*Mandate Firewall – New Zealand (WP/17)*

2.19 The paper presented information on the potential to mandate the use of a firewall as part of the CRV implementation. Referring to the APAC CRV Operations manual and the System Design Document (SDD), the CRV OG/11 meeting noted the router with an ACL can only provide very limited security and it is recommended that external security advice is sought. Three options for mandating a firewall were presented for consideration. These were Option 1 – *PCCW implemented firewall*, Option 2 – *CRV User implemented firewall*, and Option 3 – *Update INFOSEC Policy*.

2.20 The CRV OG/11 meeting discussed that another option might be that a firewall is provided by PCCWG at one end of connection for State and at another end, State may install their firewall based on States preferences. However, as implementing a firewall and its maintenance may be costly for some States, mandating firewalls for CRV needs more deliberations. The additional proposed option was that CRV OG specifies a set of requirements to meet by States to comply with CRV security policy. However, it required additional contributions from more Member States.

*Update the APAC CRV Implementation Table - Sec (WP/10)*

2.21 The latest updates presented on the planning and implementation status of CRV were as follows:

- **Under Operation**

Australia, Bhutan, China, Fiji, Hong Kong China, India, Indonesia, Japan, Malaysia, New Zealand, Philippines, PNG, Republic of Korea, Singapore, Thailand, and USA.

- **Under Provisioning**

Nepal, Mongolia, Vietnam

- **Hot Prospects in 2023**


Sri Lanka, Pakistan, and New Caledonia

2.22 The CRV OG/11 meeting reviewed and updated the APAC CRV Implementation Table, which is provided in **Appendix C** of this paper.

*ATN Routing and Telecommunication Update – USA (WP/21)*

2.23 USA presented the latest Asia/Pacific Regional data telecommunication infrastructure and ATN routing that includes Air Traffic Message Handling System (AMHS) and Aeronautical Fixed Telecommunication Network (AFTN), which is updated and maintained by Aero Thai. The CRV OG/11 meeting was requested to review the information shown in the table, share any plan for new AMHS/AFTN connection, and provide update or modification of the table format to ICAO secretariat during the CRV OG/11 meeting or provided by email after the CRV OG/11 meeting.

2.24 After reviewing the structure of the table, the CRV OG/11 meeting suggested to modify it to accommodate the latest requirements. It was agreed that ACSICG Co-Chair, CRV OG Co-Chairs, and ICAO Secretariat would deliberate and review the structure of the table. The revised structured table will be uploaded on [CRV portal](#) hosted by Airways New Zealand and updated by all APAC Member States. The table will be further reviewed and updated by the ACSICG/10 Meeting.

2.25 After CRV OG/11 Meeting, the revised table is prepared by ACSICG Co-Chair, CRV OG Co-Chairs, and ICAO Secretariat and uploaded on the CRV portal hosted by Airways New Zealand. The table was **also shared with Member States on 17 March 2023** for updates. The latest updated table from Member States can be accessed by  [AsiaPac ATN Infrastructure Routing Plan.xlsx](#) on CRV portal hosted by Airways New Zealand.

*Upgrade/Downgrade of CRV Circuits Subscribed and Addition of New Sites and Services in the CRV Contract – Sec (WP/04)*

2.26 The paper summarized the outcomes of the discussion of the ICAO CRV Steering Group formed in the CRV OG/9 to devise the terms and conditions for the addition of new services, upgrade/downgrade of Packages along with the addition of new sites by the CRV contracted States into their contract.

2.27 The revised proposal for upgrade/downgrade/addition of new sites and services with a reasonable pre-estimate of the anticipated losses suffered by PCCW Global was shared by PCCWG in CRV OG/9 Meeting, which withdrew cancellation charges and five years term for each upgrade case and addition of new sites/services. The CRV OG/10 Meeting further deliberated, reviewed, and endorsed the proposal to work further on revising relevant documentation of the CRV common Package. In CRV OG Ad-hoc Expert group Meetings, relevant Clauses for upgrade/downgrade/addition of new services or sites were deliberated and finalized. The addendum to Terms and Conditions was presented to the Meeting for adoption. The documents to be updated in CRV Common Packages after the endorsement of relevant clauses by CRV OG/11 were listed.

2.28 The CRV OG/11 meeting **reviewed, modified and endorsed** the Addendum to Terms And Conditions between PCCW Global and CRV Authority **v3**, High-Level Individual Site Questionnaire **v2.2**, PCCWG System Design Document **v4.6**, and Service Order Form (**v2**), which can be accessed on [ICAO CRV Secure portal](#), and [CRV portal](#) hosted by Airways New Zealand.

2.29 The CRV OG Operations Manual v1.2 has been updated to incorporate agreed Addendum to Terms and Conditions between PCCW Global and CRV Authority.

*Various CRV users and their joining process – Sec (WP/05)*

2.30 To follow up the Action Item 9-9 of the CRV OG/9 and Action Item 6-1 of SWIM TF/6, the paper presented the outcomes of relevant discussion of various CRV OG Expert Ad-hoc group Meetings along with the definition of CRV users prepared by CRV OG Expert Ad-hoc group in concurrence with MET SG experts and their joining process for Meeting approval.

2.31 The reviewed and finalized definition agreed upon by the Meeting was as follows:

**CRV USER – State/Administration:** An entity officially designated by the State to provide the air traffic or air navigation services the State is obligated to provide according to the ICAO provisions.

**CRV USER – Industry:** An entity not officially designated by the State but ~~sanctioned~~ **authorised** by the State to provide aviation or related services commercially.

2.32 It was approved that State's ANSPs will assign IP addresses to any entities joined CRV, and all entities will sign their contract individually. Additionally, for the difference in the joining process, CRV Users- State/Administration **will follow the same process** as mentioned in CRV OG Operational Manual and CRV Landing Page, while industries will **need sponsorship** by States.

2.33 The relevant amendments to CRV OG Operations Manual to include CRV Users definitions and CRV Implementation Plan for IP addressing assignments process for various CRV Users was completed.

*Extension of CRV Contract – Sec (WP/06)*

2.34 The CRV OG/11 meeting noted the APANPIRG **Conclusion APANPIRG/33/7 - Extension of CRV Contract for one year** adopted by the APANPIRG/33 to extend the contract duration for **one additional year**. The ICAO Secretariat has the issued State Letter **Ref.: T 8/2.15 – AP003/23(CNS)** dated **4 January 2023** on the subject: - *Extension of CRV Contract for one year and a reminder for the target year of CRV Implementation by 31 December 2023 in the APAC Region* to inform Member States about the extension of the current contract on same Terms and Conditions and urged to initiate a service order with the PCCW Global for CRV implementation as early as possible, on or **before 31 December 2023** and synchronize the implementation of CRV in the APAC region.

2.35 The CRV OG/11 meeting was invited to modify their contract with PCCWG, as required, and initiate a service order with the PCCW Global for CRV implementation before 31 December 2023, if not joined CRV.

*Flexibility in CRV Contract Renewal- New Zealand (Flimsy/01)*

2.36 CRV OG Co-Chair (Asia) shared that the term of the contract with the CRV Service Provider (PCCW Global) was set for an initial five years with five additional one-year contract additions totaling a ten-year contractual agreement until 31st December 2027. However, there is an overhead to

managing rolling one-year renewals, a different degree of flexibility is required.

2.37 With some States approaching the five-year anniversary of their contracts with PCCWG, questions were being asked about the ability to sign for different periods of time. Therefore, it was proposed that the CRV OG Operations Manual is updated to allow contract extensions of two or three year. The new proposed wordings were:

*The terms of the contract with the CRV Service Provider is set for an initial five years with additional One-year, Two year or Three year contract additions until 31st December 2028.*

2.38 The CRV OG/11 meeting agreed for the proposed clauses to add to CRV OG Operations Manual and CRV OG OM v1.2 was updated accordingly.

*Addition of New Package D+ in CRV – Sec (WP/07)*

2.39 The paper presented the details of a new Package D+ and proposed to add them in the current CRV common Packages for Meeting review and adoption. The list of documents to be updated in CRV Common Packages after the endorsement of Package D+ definition by CRV OG/11 was shared and the finalized definition and updated CRV common Packages to include the new Package D+ was presented by PCCWG through the WP/08 to the CRV OG/11 meeting.

*CRV - New Package D+ - PCCW Global (WP/08)*

2.40 PCCWG presented the details of new Package D+. The CRV OG/11 meeting noted the CRV common Packages include four major Packages – A, B, C & D and two variations (B+ & C+). To enhance the existing Package D option, Package D+ was defined.

2.41 The CRV OG/11 meeting noted that the service management and SLA of Package D+ connectivity is the same as Package D. In addition, the commercial price for Package D+ is same as Package D. Nonetheless, it needs to add the additional NID price which is available from the current CRV price book in the common Package.

2.42 The CRV OG/11 meeting **reviewed, modified, and adopted** the modified CRV common Package documentation incorporating Package D+. The collective modified CRV common Package document agreed for the upgrade/downgrade/addition of new sites and services and Package D+ is provided on the [ICAO CRV Secure portal](#), and [CRV portal](#) hosted by Airways New Zealand.

*CRV Network Yearly Service Review 2022 - PCCWG (SP/01)*

2.43 PCCWG shared Latest CRV Updates and CRV Network Yearly Service Review for 2022. The CRV OG/11 meeting was informed about the 2022 Ticket Summary by Ticket Type and their overview. PCCWG informed that there are 65 circuits in 34 cities with different CRV Packages, A, B+, C+, C and D. There are 2 service providers in the CRV network and 4 circuits (B+ and D) are under implementation. It was further informed that 3 cities are joining CRV in 2023, which are French Polynesia / New Caledonia, Sri Lanka – Colombo, and Pakistan- Karachi.

*CRV Post Implementation Issues in Bhutan – Sec (WP/11)*

2.44 The paper updated the progress of the issues faced by Bhutan related to CRV post implementation in 2021 due to the non-readiness of peer States and the actions taken by CRV OG and ACSICG for its resolution.

2.45 The CRV OG/11 meeting noted that Bhutan informed the ICAO APAC Office through email on 6 July, 2022 that considering the connectivity between Bhutan and Thailand is currently under

inspection process for reliability/stability test and after consensus with New Zealand, Bhutan has decided to discontinue the temporary CRV connectivity with New Zealand.

2.46 Thailand confirmed that the CRV connectivity with Bhutan had been implemented. Therefore, the ad-hoc group formed to resolve this issue was **dissolved**. The CRV OG/11 meeting shared its appreciation to the work done by the Ad-hoc group and participating States' tremendous support in resolving the issue. The relevant action items resulting from past CRV OG and ACSICG Meetings were marked as closed.

*PASNet for the Pacific Islands CRV connectivity – New Zealand (WP/23)*

2.47 The paper presented an overview of the options for using PASNet to connect the Pacific Islands to CRV. Considering the options for network connectivity to some Pacific Islands are limited and in some cases expensive, the World Bank implemented the **Pacific Aviation Safety Network (PASNet)** in 20xx. Till today, 4 cycles of installation have occurred in the Pacific. The Sites currently supported are Tonga (one site is Airways New Zealand owned, the other is Tonga owned, Samoa, Cook Islands, Niue, Tarawa, Solomon Islands, and Funafuti. Soon to be installed are 3 sites in Vanuatu.

2.48 The PASNet was built in a similar way to the CRV, focusing on immediate needs. The options for connecting CRV to PASNet have been narrowed to two options: *installing a new CRV NID in Christchurch* and *using the exiting Airways New Zealand Christchurch CRV NID*. The CRV OG/11 meeting deliberated both options' operating model, cost recovery, monitoring, etc. The CRV OG/11 meeting noted that in each option there will be design changes required to the current installation to support the allocated IP address for the Pacific Island State, routing to the peering State and specific services expected to be used. Additionally, it was informed that the cost to implement connectivity of CRV over PASNet is still unknown. There is a strategy discussion on this in February 2023 within Airways New Zealand.

2.49 The CRV OG/11 meeting discussed the significance of PASNet project, its potential benefits after implementation and noted the progress of the project. Further updates on the project will be shared by New Zealand in CRV OG Meetings.

*Progress of CRV Implementation by APAC Member States*

2.50 Fiji, India, Indonesia, Japan, Malaysia, and Republic of Korea presented the CRV implementation status by different Papers.

*MPLS/IP Based Inter-Regional Connection – Sec (WP/12)*

2.51 The paper provided the current status of discussion being done for potential interconnection of CRV and REDDIG II and CRV and New PENS and requested APAC Member States to record their interest, willingness, or need for interconnection of the CRV with other regional networks such as REDDIG II / New PENS with the ICAO secretariat.

2.52 As per the latest updates from ICAO SAM Office, Lumen LATAM (Latin America) has been sold to Cirion Technologies. PCCW Global is a client of Cirion Technologies in Chile, which allows to building of an interconnection solution using the Santiago facilities. The ICAO SAM Secretariat requested Cirion Technologies to discuss the proposal with PCCW Global personnel and formally presented it in the next Meeting. Therefore, at present, there is no concert technical proposal ready to work further for CRV and REDDIG II interconnection. Furthermore, the Meeting noted that the interconnection proposal for CRV and New PENS is in progress.

*Inter-regional connection between Russian and APAC AMHS Centers – Russia (WP/18)*

2.53 Russia informed that in the Russian Federation, the COM centers of Moscow and Khabarovsk performed the function of Interregional AFS Gateways between ICAO EUR/NAT and APAC regions providing aeronautical information exchange not only for Russia but also for European countries. The message exchange between Russia and ICAO APAC region via the interregional gateway is performed using AFTN protocol, which prevents the use of advanced methods of aeronautical information exchange such as IWXXM, AIXM, FIXM and others.

2.54 Considering the restrictions on the use of Cisco equipment at Moscow and Khabarovsk COM centers, the Russian Federation proposed to study the following solutions for connecting Moscow and Khabarovsk COM centers to CRV to ensure the transition to AMHS technology with COM centers of the APAC region (Japan and China)

- Possibility for CRV provider to use equipment from other (not Cisco) manufacturers as CE routers in the COM centers of Moscow and Khabarovsk.
- Implementation of dedicated L2 VPN links between Moscow and Khabarovsk COM centers and corresponding COM centers of the APAC region (Japan and China);
- Implementation of interregional connection between the CRV and aeronautical virtual IP network of the Russian Federation based on MPLS Network-to-Network Interface (NNI) (CRV OG/9 - WP/12).

2.55 With due consideration to the time needed to study the available solutions, Russia proposed to implement an interim connection between COM centers via a dedicated L2 VPN link to expedite transition to AMHS. The current status of transition to AMHS with Japan and China was shared.

2.56 In addition, the Russian Federation also shared its support for the initiative to explore potential MPLS/IP based inter-regional connection between CRV and REDDIG II networks. The establishment of such connection will eventually provide for the transition to AMHS via the CRV and ensure exchange of other types of information as one of the prerequisites for system-wide information management (SWIM) implementation.

2.57 Japan informed that as it had already implemented CRV, instead of establishing an additional L2 VPN link, Japan would prefer to wait for Russia to join CRV. Russia shared its willingness to discuss with Japan other proposals for interconnection individually.

*Update on Using the Rest of CRV MSA - Sec (WP/13)*

2.58 The paper presented an update on the recent development of using the balance fund of the MSA. The Meeting noted that to get the formal consent from the Pioneer States/Administration to utilize the remaining fund for the CRV, the APANPIRG/33 endorsed the **Conclusion APANPIRG/33/6 - Revised Amendment of the Management Service Agreement for CRV project (RAS14801)** and agreed that the remaining fund would be utilized in 5 years starting from the actual date of adoption of the revised document by APANPIRG.

2.59 As such, ICAO Secretariat issued State Letter **Ref.:** T 8/2.15 –AP-CNS 00xx/23 dated 9 January 2023 and Ref.: T 8/2.15 – AP-CNS 0026/23 dated 17 January, 2023 on the subject: - *Revised Amendment of the Management Service Agreement for the CRV project (RAS14801)* to Countersign the Revised amended Project Document or inform the intention to receive the share of the remaining fund balance to 16 pioneer States. Additional clarifications were issued on 17 January 2023.

2.60 In response, **16** Member States countersigned or shared confirmation to countersign the Revised amended Project Document to provide consent to utilize the remaining fund for the CRV.

2.61 It was proposed that after finalizing of Terms of Reference for the approved task and estimated cost, if the remaining amount of is too low to utilize for agreed tasks, CRV OG may deliberate and decide on additional cost-sharing arrangements. Additionally, if it is agreed that the remaining amount is too low for approved work and there is no consensus for the remaining cost-sharing arrangement, it is proposed to refund the remaining share to all 16 pioneer States/Administrations.

*Using the rest of money: ToR of Safety Assessment – New Zealand (WP/14)*

2.62 New Zealand presented Safety Assessment options for the CRV using the remaining Pioneer State money. Discussion at CRV OG Meeting has suggested that the remaining funds from the CRV Project could be used to facilitate a Safety Assessment of the CRV network. It was assumed that the Safety Assessment means a Cyber Security Review. The **6 possible Security Review** options could be considered by the CRV OG/11 meeting were as follows:

- Option 1 - Desktop review of the PCCWG implementation only
- Option 2 - Penetration test of the PCCWG implementation only
- Option 3 - Desktop review of the end-to-end implementation including States connectivity
- Option 4 - Penetration test of the end-to-end implementation including States connectivity
- Option 5 - Engage a Security consultant to review the Common Package, RFP documentation including the response, Implementation Plan and the Operations Manual and provide a Security recommendation based on this review.
- Option 6 – Request PCCWG to carry out either a one off, annual or biennial Security Reviews and disclose the recommendations to be discussed by the CRV OG.

2.63 It was anticipated that this will use all of the remaining funds from the project. Consideration from the CRV should be given to the possibility of needing to contribute further funds depending on the Terms of Reference (ToR) and subsequent quote. The CRV OG/11 meeting deliberated for various proposed options and **agreed to adopt Option 2 and 5.**

2.64 With the aforementioned, the following **Draft Conclusion** was endorsed by the CRV OG/11 for ACSICG/10 adoption.

<b>Draft Conclusion ACSICG/10/XX (CRV OG/11/03) – Selection of Security Review Options 2 and 5 and Develop a ToR</b>	
What: The utilisation of the CRV Project Funds would be used to carry out a Security Review of the CRV.	Expected impact: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: To provide State assurance on the security of the CRV network.	Follow-up: <input type="checkbox"/> Required from States
When: 3-Feb-23	Status: Draft to be adopted by ACSICG
Who: <input type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input checked="" type="checkbox"/> Other: CRV OG	

2.65 Due to limited time, as a way forward, it was agreed that a draft ToR will be prepared by CRV OG Ad-hoc Expert Group and submitted to the ACSICG/10 Meeting for review and approval. After the ACSICG/10 Meeting approves ToR, **quotations will be requested from various cyber security expert agencies and appraised cost with a tentative plan and timelines for its accomplishment will be presented to the CRV OG/12 Meeting** for agreement on the scope of work

and the final decision for utilization of fund for agreed ToR. After the approval of CRV OG/12, an agency will be selected, and the chosen agency will execute the task.

2.66 The draft ToR for Security Review using Options 2 and/or 5 was prepared by CRV OG Ad-hoc Expert Group. The draft ToR was also shared with the CRV OG/11 delegates for their review and feedback on 25 April 2023. There were no comments received for modifications of the proposed draft ToR. The draft ToR is being submitted to the ACSICG/10 Meeting **for review and approval in Appendix D.**

2.67 With the aforementioned, the following **Draft Conclusion** is proposed for ACSICG/10 adoption.

<b>Draft Conclusion ACSICG/10/XX</b> – Adoption of ToR for CRV Security Review using Options 2 and/or 5	
What: The utilisation of the CRV Project Funds would be used to carry out a Security Review of the CRV using <b>Options 2 and/or 5</b> as per the ToR provided in <b>Appendix D</b> . <b>Option 2</b> - Penetration test of the PCCWG implementation only <b>Option 5</b> - Engage a Security consultant to review the Common Package, RFP documentation including the response, Implementation Plan and the Operations Manual and provide a Security recommendation based on this review	Expected impact: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: To provide State assurance on the security of the CRV network.	Follow-up: <input type="checkbox"/> Required from States
When: 26-Apr-23	Status: Draft to be adopted by ACSICG
Who: <input type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input checked="" type="checkbox"/> Other: CRV OG	

*(New) PENS and the EATM CERT Cybersecurity Considerations – EUROCONTROL (SP/02)*

2.68 The presentation generically introduced the security management practices from the PENS Community perspective and the activities of the European Air Traffic Management Computer Emergency Response Team (EATM CERT) with a focus on penetration testing (ethical testing). The CRV OG/11 meeting was informed that the Cybersecurity Assessment conducted by EUROCONTROL/NM in 2018 highlighted that the New PENS Contract/Service incorporates all industry good practices on security requirements. PENS Community approaches to User Security and Cyber Security were shared. With the introduction of the risk levels definition, the results of penetration testing on aviation systems were explained.

2.69 A query was raised about the reaction of the New PENS service provider and other States to conducting a penetration test. Eurocontrol informed that the penetration testing was volunteered by States, and the New PENS service provider was obliged to allow penetration testing as per the contract.

*(New) PENS IPv6 Addressing Considerations- EUROCONTROL (SP/03)*

2.70 The presentation shared that PENS is IPv6 enabled (dual IPv4/IPv6 stack available) and each individual PENS User is assigned upon request 4x /48 IPv6 public ranges by EUROCONTROL. Ranges assigned to any given PENS Users are public, specific to the user hence unique on a global scales. Ranges assigned to the PENS Users are therefore decoupled from that of the PENS Service Provider avoiding the need for IP address change/renumbering when changing service provider. Furthermore, the IPv6 address space allocation which is performed through the “Network

Addresses Management Services (NAMS)” were introduced.

2.71 The CRV OG/11 meeting noted that IPv6 is used for ATFM and AMHS is still using IPv4. A query was raised about the action taken by ICAO for IPv6 regional block allocation. ICAO Secretariat informed that as of today, there is no requirement from the Trust Framework Panel to use a dedicated block of IPv6 addresses or a fully qualified DNS. Analysis and studies are ongoing but there is still no decision.

*Review ToR and Action Items - Sec (WP/15)*

2.72 The CRV OG/11 meeting reviewed the ToR of CRV OG and further updated the Action Items for CRV OG, which is provided in **Appendix E** of this paper.

*Date and Venue for the Next Meeting*

2.73 The CRV OG/11 meeting agreed to organize the next CRV OG Meeting as an **In Person Meeting** to further progress tasks listed in the Terms of Reference, with a tentative date from **24-26 January 2024**. The Secretariat will coordinate for hosting the next Meeting in Members States of the group or will organise it in ICAO APAC Office Bangkok and inform participants in due course of the exact dates and venue.

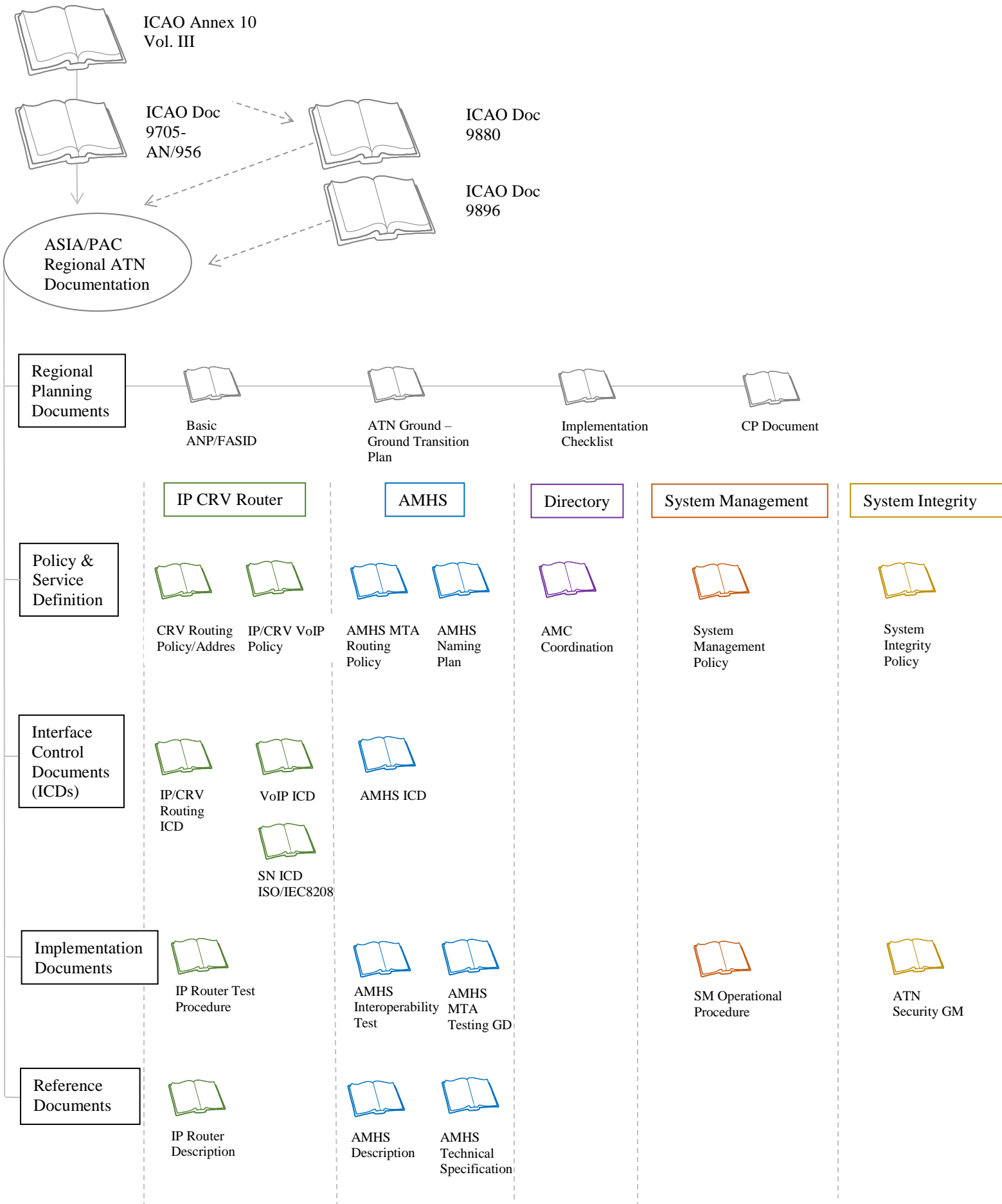
### **3. ACTION BY THE MEETING**

3.1 The meeting is invited to:

- a) review the outcome of the CRV OG/11 and take any necessary follow-up actions;
- b) review and update the Asia/Pacific regional ATN Documentation Tree, and adopt the draft Conclusion to publish ATN Documentation Tree if required;
- c) note, review and update ATN Routing and Telecommunication table;
- d) adopt the draft ToR for CRV Security Review using Options 2 and/or 5; and
- e) discuss any matters as appropriate.

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APAC CRV Risk Register as at 14/09/2022



Risk Assessment<sup>v</sup>

Risk Owner	Hazard / threat	Risk Description				Impact Category <sup>i</sup>	Consequence rating <sup>iv</sup>	Current Controls in place	Likelihood	Current Risk (with current controls) L/M/H/E	Further actions to be taken (mitigations/treatments)	Action Owner and date due <sup>ii</sup>	Target Risk (after actions and current controls) <sup>iii</sup>
		Due to	Event (Something happens)	Consequence (result, impact "leading to . . .")									
OG	Failure of multiple states connections	Common POP	Maintenance or failure at the POP	Loss of redundancy or full communication between several APAC states	Service Delivery Aviation Safety Asset Performance	Major	<ol style="list-style-type: none"> <li>1. APAC CRV Overview Drawing showing POP connectivity.</li> <li>2. Monthly service provider reports.</li> <li>3. Service Provider invited to APAC CRV OG meetings</li> <li>4. Maintenance and outage notifications</li> </ol>	Unlikely	Medium 8				
OG	Increased billing	Joining process	State joins before peering states are ready	Delayed decommissioning of current services and increased billing as supporting dual services.	Financial	Minor	<ol style="list-style-type: none"> <li>1. APAC CRV Operation manual detailing the joining process.</li> <li>2. Webinars on the processes</li> <li>3. Lessons learned discussions at APAC CRV OG meetings</li> </ol>	Possible	Low 3				
OG	Loss of a states connectivity	Routing failure	Service provider or last mile connection fails but not the NID to the states network	Loss of connectivity with no failover resulting in lost communication	Service Delivery Aviation Safety Asset Performance	Major	<ol style="list-style-type: none"> <li>1. Service Providers System Engineering Plan</li> </ol>	Possible	Medium 12				
OG	CRV Failure	Service provider issue	Global network or multiple POP issue	Complete loss of communication across APAC	Service Delivery Aviation Safety Asset Performance	Major	<ol style="list-style-type: none"> <li>1. APAC CRV Overview Drawing showing POP connectivity.</li> <li>2. Monthly service provider reports.</li> <li>3. Service Provider invited to APAC CRV OG meetings</li> <li>4. Where possible implement Internet based B2B connections outside of the APAC CRV Network</li> </ol>	Rare	Low 4				

- 
- <sup>i</sup> There can be multiple categories that the risk may fall into and they are all relevant. Once you have identified all categories, the one which as the highest consequence will be taken to combine with the likelihood to get a risk rating
- <sup>ii</sup> - The action owner needs to be a specific person responsible for this actions completion
- When assigning a due date, be generous to ensure it is achievable
- <sup>iii</sup> This rating is encompassing what the risk would be if ALL the mitigation actions were to be completed (consequence, likelihood or a combination of both can be reduced)
- <sup>iv</sup> The consequence rating does not necessarily need to be the 'worst case scenario' but should be the most **feasible** for that risk
- <sup>v</sup> Use the [Risk Evaluation Framework](#) to do the assessment of the risk

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Business unit:

Date of review:

Participants:

Risk Owner	Hazard	Risk description			Impact	Current controls	Risk assessment (current controls)				Next Review Date	Risk assessment (Target level)				Future Actions	Action Owner	Action Due Date
		Due to	Event	Resulting in			Severity	Probability	Risk Rating	Risk Level		Severity	Probability	Risk Rating	Risk Level			
CRV OG	Failure of multiple states connections	Common POP	Maintenance or failure at the POP	Loss of redundancy or full communication between several APAC states		<ol style="list-style-type: none"> <li>APAC CRV Overview Drawing showing POP connectivity.</li> <li>Monthly service provider reports.</li> <li>Service Provider invited to APAC CRV OG meetings</li> <li>Maintenance and outage notifications</li> </ol>	Major	Improbable		2C								
CRV OG	Increased billing	Joining process	State joins before peering states are ready	Delayed decommissioning of current services and increased billing as supporting dual services.		<ol style="list-style-type: none"> <li>APAC CRV Operation manual detailing the joining process.</li> <li>Webinars on the processes</li> <li>Lessons learned discussions at APAC CRV OG meetings</li> </ol>	Minor	Remote		3D								
CRV OG	Loss of a states connectivity	Routing failure	Service provider or last mile connection fails but not the NID to the states network	Loss of connectivity with no failover resulting in lost communication		<ol style="list-style-type: none"> <li>Service Providers System Engineering Plan</li> </ol>	Major	Remote		3C								
CRV OG	CRV Failure	Service provider issue	Global network or multiple POP issue	Complete loss of communication across APAC		<ol style="list-style-type: none"> <li>APAC CRV Overview Drawing showing POP connectivity.</li> <li>Monthly service provider reports.</li> <li>Service Provider invited to APAC CRV OG meetings</li> <li>Where possible implement Internet based B2B connections outside of the APAC CRV Network</li> </ol>	Major	Extremely Improbable		1C								

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<b>Consequence by Categories</b>	Negligible	Minor	Major	Hazardous	Catastrophic
Aviation Safety					
Service Delivery					
Reputational					
Security					
Financial					
Legal, Regulatory and Compliance					

UPDATED APAC CRV IMPLEMENTATION TABLE

SN	State/ Administration (with* is BBIS; marked in blue- not yet join CRV/ no updates)	States /Administrations connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
1	Afghanistan					
2	Australia*	Fiji New Zealand USA PNG Singapore	Contract in May2018 and service readiness in 3Q 2018	AFTN, ADS-B, AMHS, Voice With: <u>Completed:</u>  <b>Fiji</b> March,2019 (AMHS June 2019/AIDC, Voice completed April) <b>New Zealand</b> , February, 2019 (AMHS June 2019, AFTN May 2019/AIDC), March, 2019 (Voice April 2019 completed) <b>Singapore</b> Dec, 2020 (AMHS/AIDC); <b>PNG</b> June 2021 (AFTN) Oct 2021 (Voice) <b>USA</b> March 2019 (AFTN) March 2019 (Voice)  <u>Pending:</u>  <b>South Africa TBC</b> (AMHS/AIDC, Voice);	Staged approach	Termination of current COM contract

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SN	State/ Administration (with* is BBIS; marked in blue- not yet join CRV/ no updates	States /Administrations connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
				Indonesia TBC 2022 (AMHS/AIDC, Voice, ADS-B);		
3	Bangladesh					
4	Bhutan	Thailand (Bangkok)	Contract signed on Oct 2019.  CRV installed successfully in Dec 2021.  CRV P2P Test between Paro- Bangkok completed.  CRV P2P Test between Paro- Mumbai completed on Jan 2023  CRV cutover between Paro-Mumbai is scheduled on March 2023	AMHS first. Voice and ADS-B – to be decided.	Staged Approach	Dependent on India for full utilization of CRV network.

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SN	State/ Administration (with* is BBIS; marked in blue- not yet join CRV/ no updates	States /Administrations connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
5	<b>Brunei Darussalam</b>					
6	<b>Cambodia</b>		As early as convenient, dependent on neighbouring countries			Internal decision making
7	<b>China*</b>	Hong Kong China Japan Republic of Korea	Contract signed on 21 June 2020.	Applications targeted: Data(AMHS) With: Hong Kong 3Q2020; Japan 4Q2020; Thailand TBD; India 2022. Republic of Korea 4Q2022 Mongolia 4Q2022 ATFM test with Japan and ROK at Sep 2020 over CRV ADP exchange with Mongolia 4Q2022	Staged approach	

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SN	State/ Administration (with* is BBIS; marked in blue- not yet join CRV/ no updates	States /Administrations connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
8	<b>Hong Kong, China*</b>	Philippines China Japan Thailand Vietnam	Contract signed on 6 April 2018.  Connection was installed successfully in June 2018.	<b>With Manila</b> CRV-Voice put into operation in August 2018 CRV-AMHS put into operation in May 2019  <b>With Fukuoka</b> CRV-AMHS put into operation in September 2020  <b>With Beijing</b> CRV - AMHS POT in March and operation in April 2021  <b>With Bangkok</b> CRV-AMHS put into operation in August 2022	Staged approach	Need to coordinate with relevant CAAs/ANSPs in joining CRV in a harmonized manner, etc.
9	<b>Macau China</b>		December 2022	To be confirmed	Staged approach	Migration from X.25 to IPS
10	<b>Cook Islands</b>					
11	<b>Democratic People's Republic of Korea</b>		Contract in 3Q2018 and service readiness in 4Q2018	AFTN and VoIP		

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SN	State/ Administration (with* is BBIS; marked in blue- not yet join CRV/ no updates)	States /Administrations connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
12	Fiji*	Australia New Zealand USA	Contract in May 2018 and service readiness in 3Q 2018.	Data (AMHS) and VoIP With: Australia ATS voice April 2019 completed, AMHS completed in July 2019, NZ ATS voice completed April 2019 and USA ATS voice completed in March 2019 and AMHS completed in April 2019.	Staged approach	CBA, safety case
13	France:  -New Caledonia  -French Polynesia	Fiji  New-Zealand	Q3/2023  Q3/2023	ATS Voice, AMHS  AFTN/AMHS with NZ.	Staged approach	Depends on an agreement with peer States on adding a layer of encryption (PSK) over CRV

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SN	State/ Administration (with* is BBIS; marked in blue- not yet join CRV/ no updates	States /Administrations connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
14	India*	<p>The GRE tunnels has been setup between:</p> <p>Mumbai–Bangkok, Mumbai- Singapore, Mumbai–Beijing and Mumbai-Paro.</p> <p>Mumbai- Kathmandu GRE Tunnel under tests</p> <p>Note: AMHS trails between Mumbai- Bangkok over CRV has been carried out successfully. AMHS trails between Mumbai- Singapore, Mumbai - Bhutan over CRV are presently in progress.</p>	<p>Contract for CRV implementation with M/s PCCW in India Signed on 15<sup>th</sup> March, 2022. CRV Circuit has been delivered in Dec, 2022.</p> <p>CRV Cutover: End of 1Q2023</p>	AFTN/AMHS, , ATS Voice & ADS-B	Staged approach	<p>Note: On successful trial Operation with BBIS/BIS States, the CRV Cutover will be planned.</p>

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SN	State/ Administration (with* is BBIS; marked in blue- not yet join CRV/ no updates	States /Administrations connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
15	Indonesia		Contract in 1Q2022 and service readiness in 2023.	Australia 2023 (voice & data) Malaysia 2023 (voice) Papua New Guinea 2023 (voice) Philippine 2023 (voice) Singapore 2023(voice & data) USA 2023(voice)		
16	Japan*	Hong Kong China USA Singapore China RoK Philippine	Contract signed in Nov.2017 and service readiness in1Q 2018 for Fukuoka	<b>USA</b> AMHS(1Q 2019) Voice(2Q 2021) <b>Hong Kong, China</b> AMHS(3Q 2020) <b>Singapore</b> AMHS(4Q 2020) <b>China</b> AMHS(1Q 2021) ATFM(1Q 2021) <b>Taipei ACC</b> Voice(1Q 2022) AIDC(planned 1Q 2023) <b>R.O.K</b> AMHS(4Q 2022) Voice(1Q 2021) and additonal line plan in progress AIDC(planned 1Q 2024) <b>Philippine</b> Voice(2Q 2022)	In progress	
17	Kiribati					

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SN	State/ Administration (with* is BBIS; marked in blue- not yet join CRV/ no updates	States /Administrations connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
18	Lao PDR					
19	Malaysia	Thailand Singapore Indonesia India	Contract signed between CAAM and PCCWG in Sept 2022.  CRV service readiness started in Nov 2021.	<p><b>Thailand</b></p> <ol style="list-style-type: none"> <li>1) Network connectivity testing (AMHS/AIDC) – Oct 2022</li> <li>2) Completed cut over &amp; migration (AMHS /AIDC) – Jan 2023</li> <li>3) Voice &amp; ADS-B (testing, migration-TBD)</li> </ol> <p><b>Singapore</b></p> <ol style="list-style-type: none"> <li>1) Network connectivity testing (AMHS/AIDC) – May 2022</li> <li>2) Estimate cut over &amp; migration (AMHS/AIDC) – Q1/2023</li> <li>3) Voice &amp; ADS-B (testing, migration-TBD)</li> </ol> <p><b>India</b></p> <ol style="list-style-type: none"> <li>1) Estimate network connectivity testing (AMHS/AIDC) – Q1/ 2023</li> <li>2) Estimate cut over &amp; migration (AMHS/AIDC) – Q1/2023</li> <li>3) Voice &amp; ADS-B (testing, migration-TBD)</li> </ol> <p><b>Indonesia</b></p>	Staged approach	

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SN	State/ Administration (with* is BBIS; marked in blue- not yet join CRV/ no updates	States /Administrations connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
				1) Estimate network connectivity testing (AMHS/AIDC) – Q2/2023 2) Estimate cut over & migration (AMHS/AIDC) – Q2/2023 3) Voice & ADS-B (testing, migration-TBD		
20	Maldives					
21	Marshall Islands					
22	Micronesia (Federated States of)					
23	Mongolia	CAAM and PCCWG made ICMP package test in 2021.	Contract in 1Q2022 and service readiness in 4Q2022	AFTN, ADS-B, AMHS, Voice With: <b>China</b> Dec, 2022(AMHS), (ADP) TBD Voice, ADS-B, AFTN <b>Russia</b> TBD (AFTN, ADS-B, AMHS, Voice)	staged approach	Negotiations with neighbouring countries and stakeholders on CRVs and its use are critical to implementation.

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SN	State/ Administration (with* is BBIS; marked in blue- not yet join CRV/ no updates	States /Administrations connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
24	<b>Myanmar</b>	China , India, Thailand, Laos, Bangladesh.	Contract will be signed after discussed with PCCW Global. Implementation was targeted in Q4/2023 depends on PCCW's proposal quotation. Already sent to high level questionnaire form V 2.1 in June 2021 and V 2.2 again to PCCWG in Feb 2023 to join the CRV implementation.	AFTN/AMHS, AIDC, ADS-B and Voice	Staged approach	Need to coordinate with relevant CAAs/ANSPs in joining CRV network to be harmonized regionally.
25	<b>Nauru</b>					
26	<b>Nepal</b>		SO signed with PCCW	AFTN/AMHS	Staged Approach	BBIS-state India joining the CRV network, as most traffic is routed through it

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SN	State/ Administration (with* is BBIS; marked in blue- not yet join CRV/ no updates)	States /Administrations connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
27	<b>New Zealand</b>	Australia USA Fiji French Polynesia Chile	Contract signed in July 2018 and service implemented December 2018	Australia Voice Completed March 2019 and AMHS June 2019 Completed USA Voice Completed March 2019 and AMHS March 2019 Completed  Fiji Voice Completed April 2019  French Polynesia AMHS and Voice  Chile AMHS (SAM regional network REDDIG)	Awaiting French Polynesia joining.  Awaiting outcome of inter-regional network connectivity discussion. For Chile	CBA attractive if all counterparts join in.
28	<b>Pakistan</b>	China India	Duly Signed Service Order Form Submitted on 23 <sup>rd</sup> Jan 2023 for Finalization / Execution of the Contract. As per timeline given by PCCW Global the CRV will be implemented by August / Sept 2023	AMHS /AFTN / VOICE	In progress	Package-D is opted to establish link between China and India.  Connectivity with other neighbouring regions / FIRs i.e. Tehran, Kuwait, Kabul & Muscat could be migrated on CRV only if the states join CRV.
29	<b>Palau</b>					

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SN	State/ Administration (with* is BBIS; marked in blue- not yet join CRV/ no updates	States /Administrations connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
30	<b>Papua New Guinea</b>	Australia USA-Oakland USA-Aireon		Australia: AFTN June 2021, Voice Oct 2021 USA-Oakland Voice November 2021 USA-Aireon Space based ADSB-July 2021	Staged approach	Completed
31	<b>Philippines</b>	Hong Kong China Singapore USA Japan	Contract signed in March 2018 and service readiness in 2Q2018	Completed: With <b>HONG KONG</b> AIDC - 2Q2019; AMHS - 2Q2019; Voice - 3Q2018.  With <b>SINGAPORE</b> AIDC – 4Q2019; AMHS – 4Q2020; Voice – 1Q2020.  With <b>USA</b> AMHS – 2Q2021; Voice – 4Q2019.  With <b>JAPAN</b> Voice – 1Q2022.  Operational Trial:	staged approach	Success transition to the New ATM center in 4Q2018  Dependencies: AIDC with Kota Kinabalu implemented via BBIS Singapore  AIDC with Ujung Pandang implemented via BBIS Singapore

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SN	State/ Administration (with* is BBIS; marked in blue- not yet join CRV/ no updates	States /Administrations connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
				<p>With <b>USA</b> AIDC – 4Q2022 Planned: With <b>INDONESIA</b> Ujung Pandang Voice – 1Q2023</p>		
32	<b>Republic of Korea</b>	Japan China	Contract in 3Q 2019 and service readiness in 4Q 2022	<p>Completed: <b>with Japan</b> Voice –March 2021 Data(AMHS) - December 2022</p> <p><b>With China</b> Data(AMHS) – November 2022</p> <p>Planned; <b>With Japan</b> Voice additional lines-from 2022 to 2023</p>	staged approach	Data(AMHS) POT in 4Q and operation from 4Q 2022
33	<b>Samoa</b>					

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SN	State/ Administration (with* is BBIS; marked in blue- not yet join CRV/ no updates)	States /Administrations connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
34	Singapore*	Australia Japan Philippines Thailand	Contract signed in May 2019 and service readiness in Dec 2019	Data (AMHS over IP) with: Australia Dec 2020 (completed); Japan Nov 2020 (completed); Philippines Dec 2020 (completed); Thailand Sep 2022 (completed); India Q1 2023 (in progress, testing completed); and Malaysia Q1 2023 (in progress, testing completed).  Voice with: Philippines Mar 2020 (completed).	Staged approach	
35	Solomon Islands					
36	Sri Lanka	Planned: Australia India Indonesia Maldives Singapore	Nov-Dec 2022	Q1 2023 - AMHS with Singapore  TBD - AMHS connectivity with Mumbai, and Male.  TBD - Direct Speech facilities with Chennai, Trivandrum, Mumbai, Male, Jakarta, Melbourne, Singapore.	Phased Approach	Package D is planned based on CBA conducted. Comparison of performance of Package D and existing IPLC circuit.

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SN	State/ Administration (with* is BBIS; marked in blue- not yet join CRV/ no updates	States /Administrations connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
37	Thailand		1. Contract in 3Q2021 Status: Completed 2. Service readiness in 2Q2022 <b>Status: Completed</b>	Data first Then voice, subject to safety case: <b><u>Bhutan 3Q2022 (Completed)</u></b> ; <b><u>Hong Kong 3Q2022 (Completed)</u></b> ; <b><u>Singapore 3Q2022 (Completed)</u></b> ; <b><u>Malaysia 1Q2023(Completed)</u></b> ; India <b><u>1Q2023</u></b> ; Beijing <b><u>2Q2023</u></b>	Staged approach	
38	Timor Leste					
39	Tonga					
40	Tuvalu					

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SN	State/ Administration (with* is BBIS; marked in blue- not yet join CRV/ no updates)	States /Administrations connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
41	United States*	Australia Fiji Japan Philippines New Zealand Papua New Guinea Tahiti Russia	Contract in January 2018	1) AMHS with Australia Fiji Japan Philippines New Zealand Papua New Guinea (2021) Indonesia (2022)  2) AIDC with Fiji Japan New Zealand Papua New Guinea (Direct planned 2021) Tahiti (via New Zealand) Indonesia (Direct planned 2022) Russia (when join CRV)  3) VoIP with Fiji Japan Philippines New Zealand Papua New Guinea (direct planned 2021) Indonesia (2022)	Staged approach	

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SN	State/ Administration (with* is BBIS; marked in blue- not yet join CRV/ no updates	States /Administrations connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
42	<b>Vanuatu</b>					
43	<b>Vietnam</b>	Hong Kong, China Singapore Philippines	Contract signed in M 4Q/2022, Service readiness in May -2023	AFTN/AMHS connectivity with Hong Kong Voice and AFTN/AMHS with Singapore Voice and AFTN/AMHS with Philippines	staged approach	

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## Terms of Reference

### 1. Background

The Asia Pacific Common aeRonautical Virtual Provide Network (APAC CRV) provides air traffic navigation networking to the Asia Pacific Region  
The APAC CRV Operations Group (APAC CRV OG) have requested a design review of the CRV.

To assess the architecture design on how well this has been secured. It will draw on industry best practices, documentation from the telecommunications provider the CRV, PCCW Global, and various CRV members using in the solution, and the experience of the consultant and wider team.

### 2. In Scope

The scope of this engagement will be limited to:

- A Security Design Review of the CRV
- Network Review

### 3. Out of Scope

The following are not in scope for the Services under this ToR:

- Any interaction with the live operational environment
- Testing which might cause a denial of service
- Implementation countermeasures and fixes. Advice will be provided on how this should be done by the consultant
- Any remediation testing is out of scope of this agreement and will be provided separately if requested in writing by the APAC CRV OG at the APAC CRV OG's cost.

## Detail of Work

### 1. Security Design Review

The consultant will carry out a security review of the CRV design.

- A review of the design concepts and the architectural design proposal. The aim is to both understand the approach for subsequent aspects of this review and to provide early feedback that may be used to guide the design down better pathways. This can start with the signing of the ToR and once the consultant has received all the design documentation, the review can be done remotely.

In reviewing the design, the consultant will:

- Use APAC CRV security objectives from the RFP and Operations Manual to be the basis of validation but will bring industry best practices to advise if these objectives are sufficient.
- Use policies and standards by relevant government, industry or internal bodies. These are likely to include but not limited to CIS benchmarks, ISO27001, ICAO Annex 17, NIST and ASD.
- Characterise the system architecture, component technologies, and interfaces to identify trust boundaries, data flows, and current security enforcing controls,
- Identify any additional controls that could be implemented to mitigate identified risks

Security Design Review	
<b>Service Type</b>	Security Design Review
<b>Assets / Targets</b>	APAC CRV
<b>Effort (days)</b>	TBD
<b>Access</b>	Remote, with calls via video conferencing when required.
<b>Approach</b>	<ul style="list-style-type: none"> <li>• Consume the documentation provided by the APAC CRV OG</li> <li>• Identify areas where further clarification may be necessary and, after receiving permission from the APAC CRV OG and PCCWG to hold video calls with authorised technical stakeholders</li> <li>• Walk through a list of preliminary findings with authorised technical stakeholders</li> <li>• Advise preliminary outcomes to APAC CRV OG Co-Chairs</li> <li>• Release a draft report for feedback</li> <li>• Release a final report</li> </ul>
<b>Specific requirements</b>	<ul style="list-style-type: none"> <li>• Up to date documentation</li> <li>• A list of authorised APAC CRV OG and PCCWG individuals who can respond to technical questions during the engagement</li> </ul> <p>Note: These requirements must be met at least 1 week before work is due to commence.</p>

### 2. Network Review of the APAC CRV

Security Design Review	
<b>Targets</b>	PCCWG's APAC CRV routers
<b>Perspectives</b>	Unauthenticated physical network access Authenticated physical network access
<b>Effort (days)</b>	TBD
<b>Access</b>	On site using Consultant provided Laptop Computers with options to provide testing VM within instance at consultant's discretion
<b>Approach</b>	<ul style="list-style-type: none"> <li>• The Consultant will be positioned on-site within a PCCWG POP or an APAC CRV OG members server/equipment room</li> <li>• The Consultant will be granted connectivity to the PCCWG CRV router or network element at the authorised site(s)</li> <li>• The Consultant will leverage information discovered during attacks against the CRV to compromise the CRV.</li> </ul>

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	<ul style="list-style-type: none"><li>• The Consultant is not specifically testing the APAC CRV members LAN however by design, access to this network is required to identify and access threat surface it presents to the CRV Vulnerabilities exploited or discovered that lead to a compromise of the CRV will be reported, additional vulnerabilities will be reported to the APAC CRV Co-Chairs regarding the CRV at the consultant's discretion.</li></ul> <p>The assessment is conducted according to the PTES Penetration Testing Methodology<sup>1</sup>. Activities include but are not limited to the following:</p> <ul style="list-style-type: none"><li>• Passive network reconnaissance</li><li>• Active interception and redirection of traffic</li><li>• Enumeration of exposed services and versions</li><li>• Automated vulnerability scanning of network systems</li><li>• Targeted exploitation of identified weaknesses</li><li>• Evaluation of the technical impact of each identified issue</li><li>• Horizontal and vertical privilege escalation</li><li>• Provide recommendations to mitigate any issues found in the review</li></ul>
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### 3. Restricting communications

- APAC CRV OG has requested that communications regarding the engagements in this Terms of Reference be treated as "Traffic Light Protocol: Red". That is to say, outcomes from each engagement must be limited to named individuals.
- APAC CRV OG must make the Consultant aware of any changes to personnel which might impact this requirement.
- The Consultants internal quality assurance processes necessitates peer review by another consultant; these consultants will be named.

## Deliverables

The deliverables for this project will include:

### 1. Final Report

A final report that will be delivered in PDF format and available the week following testing. It will contain the following components:

- An Executive Summary providing a summary of findings and general recommendations resulting from the review. The summary presents the assessment of APAC CRV's state of security and will detail APAC CRV's adherence to industry best practices and identify the current level of risk. The Executive Summary is intended to describe business-level risks resulting from technical findings such as regulatory, reputational and operational impacts. This section also includes a summary of severity rated as "Critical", "High", "Medium" or "Low" at a level that can be easily understood by functional management. Severity is based on a number of variables including the ease with which the vulnerability may be exploited and the potential impact of its exploitation in context of Client's business environment.
- A Detailed Findings section, which will provide in-depth details of identified vulnerabilities. This will include the steps to reproduce the issue, potential impacts of exploitation and severity rationale, and recommended remediation actions.
- A Compromise Narrative section may be included should the Consultant achieve significant compromise of APAC CRV's systems during the provision of the Services. The Compromise Narrative will provide a walk-through of the process used to achieve such compromise, including information on the tools and techniques used.

From receipt of the final report, the APAC CRV's has one working month to review and request changes. After this time the report is considered final and no further changes will be made.

### 2. Final Presentation

The Consultant will deliver the findings of the report to the relevant project stakeholders. The purpose of this presentation is to clearly articulate our findings, ensuring they are understood and to agree on the next steps.

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SN	Reference	Who	What	Due date	Status	Completed on	Result
1	1-1	ICAO RO	After inclusion by ICAO TCB of the revised budget and procurement clauses, ICAO Regional Office to send an ICAO State letter to all Pioneer States in order to propose the draft of revised annex 1 for acceptance. <b>CRV OG/6 made Decision OG/6/3 to develop SOW for the concrete proposal.</b>	20 February 2017  1/22/2022	close	The revised Annex 1 had been developed in CNS SG/21 report but no concrete proposal.	Close as it will be covered in 4-4 (CRV OG/9)
2	1-2	All member States	All States to complete their CBA and send to ICAO APAC Office	28-Apr-17	close	CRV OG/6	CBA by DSNA, Jordon, UAE, Behrain, Saudi, Egypt, Bhutan, New Caledonia, Myanmar, Fiji, Malaysia
3	1-3	Terence Palmer, Australia	Australia to include provisions in the CRV-OG operating manual for a small implementation team	1-Dec-17	close	CRV OG/7	
4	2-1	Vaughan Hickford, New Zealand:	to develop the flowchart to manage change requests to the common provisions and establish agreements between counterparts on CRV and integrate those flowcharts in the CRV Operating Manual	7-Jul-17	close	CRV OG/7	CRV Operating Manual
5	2-2	Tom Beschler, USA	to share the 10 key points of the validation of the pioneer implementation once they are agreed on	30-May-17	close	1-Apr-18	
6	2-3	all points of contact for the review of engineering	to submit their comments to husnaeen@icao.int at their earliest convenience but no later than 7 July 2017	7-Jul-17	close	CRV OG/3	
7	2-4	Vaughan Hickford, New Zealand:	to review the procedure to establish a contract with PCCW Global, Ltd and present it as a flowchart to be included in the CRV operating manual	30-May-17	close	CRV OG/3	CRV Operating Manual
8	2-5	Augustine Lau, Singapore:	to include the updated CRV Implementation schedule into the v0.5 of the implementation plan and circulate the v0.5 to all participants for acceptance	30-Aug-17	close	1-Apr-18	CRV Implementation Plan
9	2-6	USA/Hong Kong China/New Zealand/Secretariat	to propose a way forward regarding the MSA	1-Dec-17	close		

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SN	Reference	Who	What	Due date	Status	Completed on	Result
10	4-1	All member States	Complete contract with PCCW Global by no later than 12/2020	12/31/2021 Dec 2022 ( in CRV OG/9) CRV OG12	Open	on-going	
11	4-2	ICAO Secretariat	conduct CRV OG/6 and SWIM TF currently for joint development SWIM Architecture based on construcion of CRV	8-May-19	close		
12	4-3	PCCW Global & Member States	PCCW Global to reissue an updated (a)-1 Terms and Conditions on starting and ending dates of initial contract. States to note the changes and take necessary action in the contract.	1-Dec-18	close	CRV OG/7	
13	4-4	CRV OG co-chair (Asia) and & poineer CRV member States	To investigate use the MSA funds to undertake the independent satety assessment and seek approval from Pioneer States	1/1/2022 CRV OG/11 (in CRV OG/9)	close	CRV OG11 adopted the conclusion for Option 2 and 5	Depend on final fund decision from poineer MS.
14	4-5	New Zealand	further develop and maintain an addional CRV portal for use by the APAC CRV members and provide access procedure to those members that wish to access the portal.	Apr.19	close	CRV OG/5	
15	4-6	New Zealand	Finalize the draft CRV Operations Manual	Apr.19	close	CRV OG/7	<b>Conclusion CNS SG/24/4</b> - Publishing of CRV operational manual to provide the information and directions required for CRV OG performance and CRV operations
16	4-7	USA	Develop a WP on AMHS over IPS protocol only for BBIS	1-Jun-18	close	CRV OG/5	
17	5-1	Australia, Hong Kong China and Japan	Prepare a working paper for SWIM TF/3 meeting on the CRV suport for SWIM	30-Apr-19	close	SWIM TF/3	<b>SWIM TF/3: (7-10 May 2019)</b> <b>WP/06</b> - APAC Regional SWIM Implementation Options ; <b>WP/20</b> - Network Capability and Security of CRV in Carrying SWIM Data; and <b>WP/05</b> - SWIM-Enabled MET Information Services Developed by Hong Kong China;
18	5-2	ICAO RO	Disribute a State Letter to inform States of POC result	15-Mar-19	close	6-Mar-19	<b>State Letter: Ref.: T 8/2.10 – AP025/19 (CNS), 6 March 2019</b> , Subject: Notification of successful result of the CRV Proof of Concept Testing and Urging earlier implementation of CRV in APAC Region

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SN	Reference	Who	What	Due date	Status	Completed on	Result
19	7-1	China, Nepal, PCCWG	Study on use of existing VSAT infrastructure linking with CRV	Jan-22	close	CRV OG/08	
20	7-2	PCCW Global & New Zealand	Pacific solution on inter-connection with PASNET, Feasibility for interconnection	5/1/2022 Dec 2022 (CRV OG/9) CRV OG12 (decided in CRV OG/11)	Open		
21	7-3	Australia and New Zealand	Polishing draft First CRV Operations Manual	May-20	close		<b>Conclusion CNS SG/24/4</b> - Publishing of CRV operational manual to provide the information and directions required for CRV OG performance and CRV operations
22	7-4	PCCWG & USA,Australia	maintain APAC dial plan and posted on CRV OG portal	Jan-22	close		
23	7-5	AFSSP WG	encourging member states of CRV to participate	20-Jan-22	close		State Letter Ref.: T 8/2.10: AP018/20 (CNS) Subject: 2020 APAC Aeronautical Fixed Service Safety and Protection Planning Working Group Meeting (AFSSP WG 2020), 16 January 2020.
24	7-6	Hong Kong China	SWIM demonstration over mini-CRV by HK, Singapore and Thailand	1/1/2022 CRV OG/11 (CRV OG/9) CRV OG12 (in CRV OG11)	Open		HK is conducting POC with PCCWG in terms of concept for sharing surveillance data (CRV OG/9)
25	7-7	Australia and PCCWG	High level concept for inter-regional MPLS/IP connection	21-Apr-20	close		<b>WP/09:</b> MPLS/IP BASED INTER-REGIONAL CONNECTION, ICAO Sec <b>WP/11:</b> HIGH LEVEL NETWORK OPTIONS TO REDDIG, PCCWG

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SN	Reference	Who	What	Due date	Status	Completed on	Result
26	7-8	PCCWG & Australia, Fiji	Charging structure for an ANSP service provider on surveillance	20-Mar	close		IP/11 presented in OG/9 with solution
27	7-9	ICAO RO, Australia and USA	State letter to States to remind joining CRV	Mar-20	close		Ref.: T 8/2.10 - AP041 /20 (CNS) Subject: Reminder for implementation of Common aeRonautical VPN (CRV) in APAC Region by 2020, 2 March 2020
28	8-1	Co chairs, ICAO RO, USA, PCCW	CRV webinar	20-Jul-21	close	20-Jul-21	The webinar was conducted successfully on 20 July 2021
29	8-2	ICAO RO, USA, HKCAD	Timeframe for CRV supporting SWIM	Jan-22	close		Ad-hoc group created in CRV OG/9 for this task. Under action item 9-8
30	8-3	Bhutan, Hong Kong China, Singapore, India, Thailand, USA, Co-chairs, ICAO RO, concerned parties	Use CRV to support AMHS traffic for Bhutan	6/21/2021 June 2022 (CRV OG/9)	close		The action item is closed as Thailand joined CRV.
31	8-4	ICAO RO, PCCW, co-chairs	State Letter to inform States about the additional charges may apply to new users with billing start date later than 31 December 2022.	Jan-22	close	SL Ref.: T 8/2.10 – AP007/22(CNS) dated 12 January 2022	CRV webinar requested to extend the date by one year due to pandemic
32	8-5	Co-Chairs, ICAO RO, Singapore, USA	Continue the feasibility study on inter-regional connection to support business case analysis	1/1/2022 CRV OG/11 (in CRV OG/9)  CRV OG12 (in CRV OG/11)	Open		
33	8-6	Fiji, PCCW	submit a paper to ACSICG/8	21-Jun-21	close	<b>Done in ACSICG/8</b>	<b>IP/06: PRESENTATION OF PCCW NETWORK BASED IWXXM TRANSLATION AND EXCHANGE SERVICE</b>

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SN	Reference	Who	What	Due date	Status	Completed on	Result
34	8-7	USA, co chairs, PCCW, ICAO RO, concerned parties ( ad hoc)	Cyber threats protection for CRV	Jan-22	close	<b>CRV OG11: Closed it now and Reopen once concret information from ICAO is available.</b>	<p>ICAO Requirements proposed in WP/32 of CNS SG/25:</p> <ul style="list-style-type: none"> <li>a) ICAO needs to provide an IPv6 dedicated address block</li> <li>b) ICAO needs to propose a Name Space and field a DNS</li> <li>c) ICAO needs to deliver IATF recommendations for security including a Trust Framework for Digital Identities</li> </ul> <p>For the moment being there is no requirement from the TF to use a dedicated block of IPv6 addresses or a fully qualified DNS. Analysis and studies are ongoing but there is no decision for the moment being.</p> <p>The Trust Framework Study Group has been “upgraded” to the Trust Framework Panel and matters concerning the trust framework will be under its purview (AN Min. 220-16 refers).</p> <p>The ANC has already reviewed draft job cards (AN Min. 221-7 refers). In the interim, development work continues on the digital identity certificate policy as well as the development of guidance materials for an information security framework and this work will be transferred to the panel at its first meeting.</p> <p>Provisions related to information security as part of the new draft PANS-IM were recently discussed in the ANC in the 221st session and will be sent in a State Letter shortly (AN Min. 221-6 refers). These provisions are only applicable to SWIM for the moment being.</p>
35	9-1	All member States	The Member States would take some time to take reference of the ATN/AHMS Guidance Tree to review it and to provide the suggestion for modification in the ATN/AHMS Guidance Tree along with locating the position to add different CRV reference documentation.	CRV OG/11	on going		

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SN	Reference	Who	What	Due date	Status	Completed on	Result
36	9-2	ICAO Secretariat	ICAO Implementation Plan will be continued to upload on ICAO APAC e-documents portal. However, the information contained under Table-1, Table-2 and Appendix A and B would not be provided on the public portal. Under Table-1, Table-2 and Appendix A and B, a message would be added to refer to ICAO APAC CRV Secure portal or CRV Portal hosted by New Zealand to get required information along with the instructions needed	Jan-22	close		Done
37	9-3	Fiji, India, Japan, Singapore, New Zealand, USA, ICAO Secretariat, and PCCWG	<b>ICAO CRV Steering Group</b> comprised of Fiji, India, Japan, Singapore, New Zealand, USA, and ICAO Secretariat would devise the terms and conditions for addition of new services, for upgrade/downgrade of packages along with addition of new sites by contracted states into their contract	CRV OG/10 CRV OG/11	close	<b>New T&amp;C was adopted in CRV OG11</b>	
38	9-4	ICAO Secretariat	ICAO APAC Office would send a State Letter to APAC Member States, who have not joined/not process to share their intention to join CRV and when they intend to do so.	Feb-22	close		State letter Ref.: T 8/2.10 – AP026/22(CNS) 01 February 2022 Subject: - Request to share the intention to join CRV and its Tentative Timelines
39	9-5	Fiji, India, Japan, Singapore, New Zealand, USA, ICAO Secretariat, and PCCWG	<b>ICAO CRV Steering Group</b> will discuss and finalise the requirements of current CRV contract extension based on feedback received from Member States who would join CRV in next few years	Mar-22	close		
40	9-6	PCCWG	PCCWG is considering the current situation and will provide an official response if there is any contractual and commercial impacts for member states who sign the contract in 2022 but the installation date exceeds the standard lead time in 4 weeks to Sri Lanka, CRV OG Chairs, and ICAO Secretariat.	Feb-22	close		
41	9-7	ICAO Secretariat	In response to WP/18, ICAO Secretariat would present a paper to SWIM TF on behalf of CRV OG to inform about the relevant discussion in CRV OG.	May-22	close	SWIM TF/6	Done

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SN	Reference	Who	What	Due date	Status	Completed on	Result
42	9-8	CRV ad-hoc expert Strategy and Design group	CRV ad-hoc expert Strategy and Design group would join SWIM TF meetings to note important discussions related to CRV and to inform CRV OG about the relevant outcomes	CRV OG/11	close		
43	9-9	CRV OG Chairs, ACSICG Chairs, SURSG Chairs, PCCWG, India, Singapore, and ICAO Secretariat.	A specialised meeting would be organised to discuss and devise a method for non-aviation service provider's joining process to CRV. WP/17 by PCCWG for Non-aviation providers joining CRV should be also considered to discuss in the specialised meeting, which was supported by Singapore.	CRV OG/11	close	Final terms and definitions were adopted in CRV OG11	Final terms and definitions
44	9-10	APAC Member States	The meeting requested Member States to provide examples of activities under different categories provided in scope of supporting CRV Network as described in section 10.5 of draft report and scope of work defined in revised MSA	CRV OG/11	close		WP/14 presented by New Zealand in CRV OG11
45	9-11	New Zealand	Prepare the Terms of Reference (ToR) of Security and safety assessment of CRV	CRV OG/11	close	Replaced by AI 11-8	Replaced by AI 11-8
46	11-1	CRV OG Chairs, ACSICG Chairs, Australia, Japan, Jordan, Fiji, India, Hong Kong China, New Zealand, Singapore, Thailand, USA and ICAO Secretariat.	ICAO Secretariat will do necessary coordination with volunteered Member States for organising the CRV OG Ad-hoc Governance Group Meeting from 22-23 May 2023 and drafting the ToR	ACSICG/10	Open		
47	11-2	ICAO Secretariat, Co-Chair (Asia)	The latest version of CRV OG Operational Manual will be published on ICAO APAC e-docs under CNS, ICAO APAC CRV Secure portal, and on CRV portal hosted by Airways New Zealand	Feb-23	Open		
48	11-3	CRV OG Ad-hoc Expert Group	Nepal suggested to incorporate relevant guidance in the form of Process and Procedures into the CRV OG OM clarifying that Member States can request support of ICAO Secretariat and CRV OG for dispute resolution matters or other significant issues if arises. CRV OG Ad-hoc Expert Group will discuss the possibility of adding such provision and draft relevant clauses to add in CRV OG OM.	CRV OG/12	Open		

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SN	Reference	Who	What	Due date	Status	Completed on	Result
49	11-4	ICAO Secretariat, Co-Chair (Asia)	The latest version of CRV OG Implementation Plan without restricted information will be published on ICAO APAC e-docs under CNS Section. The latest version of CRV OG Implementation Plan will be uploaded on the ICAO CRV Secure portal, and CRV portal hosted by Airways New Zealand	Feb-23	Open		
50	11-5	CRV OG Ad-hoc Expert Group	CRV OG Ad Hoc Expert Group will work on to modify relevant CRV documents and update the CRV OG Operations Manual to ensure that any changes within CRV consider modifications required to the ATN Documentation document tree	CRV OG/12	Open		
51	11-6	ICAO Secretariat	The ICAO Secretariat will take necessary action to update ATN Documentation Tree on the ICAO APAC Regional Implementation Projects webpage with the proposed first snapshot of the Tree that would be modified in future as more modifications would be made by ACSICG/CRV OG Meetings	CRV OG/12	Open		
52	11-7	ACSICG Co-Chair, CRV OG Co-Chairs ICAO Secretariat	ATN Routing and Telecommunication table should be updated and shared with ACSICG/10 for updates.	ACSICG/10	on going		
53	11-8	CRV OG Co-Chairs ICAO Secretariat	Modified table will be shared with APAC Member States for updates using New Zealand hosted CRV portal. The table will be updated by ACSICG/10.	ACSICG/10	Open		
54	11-9	CRV OG Ad-hoc Expert Group	The Group will create ToR for security review of CRV for Option 2 and 5 presented in WP/14 in CRV OG11.	ACSICG/10	Open		